

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 Claim 1: (currently amended): A computer-implemented method, comprising
2 computer data signal embodied in a carrier wave for a micromagnetization analysis and used to direct
3 a computer to perform the processes of:

4 receiving an input of a parameter of a micromagnetization vector assigned to a center of a
5 divided microelement of an area to be analyzed, and a parameter of vector potential assigned to a
6 side or node of the microelement;

7 generating a magnetic field equation for providing an external magnetic field for
8 micromagnetization using the input parameters, and initializing a time;

9 obtaining a solution of the magnetic field equation;

10 obtaining a time integral of the ~~LLG~~ Landau Lifshitz Gilbert (LLG) equation using the
11 solution as an external magnetic field for an unstationary LLG equation;

12 determining whether or not micromagnetization obtained by the time integral satisfies a
13 convergence condition;

14 correcting the magnetic field equation using the obtained micromagnetization when the
15 convergence condition is not satisfied, and stepwise increasing the time; and

16 repeating the process of obtaining a solution of the magnetic field equation and subsequent
17 processes.

1 Claim 2 (currently amended): The ~~signal~~ computer-implemented method according
2 to claim 1, further comprising ~~a process of~~
3 obtaining a magnetic field using the micromagnetization obtained by the time integral of the
4 LLG equation when the convergence condition is satisfied.

1 Claim 3 (currently amended): The ~~signal~~ computer-implemented method according to claim
2 1, wherein
3 said magnetic field equation is a stationary magnetic field equation using vector potential.

1 Claim 4 (currently amended): The ~~signal~~ computer-implemented method according to claim
2 1, wherein
3 said magnetic field equation is an unstationary magnetic field equation.

1 Claim 5 (currently amended): The ~~signal~~ computer-implemented method according to claim
2 1, wherein
3 in the process of obtaining the time integral of the LLG equation, a product of a difference
4 between micromagnetization vector assigned to a target element and micromagnetization vector

5 assigned to an adjacent element and an exchange interaction coefficient is set as an exchanged
6 magnetic field by an exchange interaction with the adjacent element.

Claim 6 (canceled).

1 Claim 7 (currently amended): The ~~signal~~ computer-implemented method according
2 to claim 1, wherein
3 in the process of obtaining a time integral of the LLG equation, as an exchanged magnetic
4 field for an element contacting a boundary of an element group formed by a plurality of elements,
5 there is set a product of an externally specified one of an exchange interaction coefficient assigned
6 to the boundary and an exchange interaction coefficient assigned to the element group, and a
7 difference between micromagnetization vector assigned to a target element and micromagnetization
8 vector assigned to an adjacent element.

Claim 8 (canceled).

1 Claim 9 (currently amended): A micromagnetization analyzing apparatus, comprising:
2 an input unit receiving an input of a parameter of a micromagnetization vector assigned to
3 a center of a divided microelement of an area to be analyzed, and a parameter of vector potential
4 assigned to a side or node of the microelement;

5 a magnetic field equation generation unit generating a magnetic field equation for providing
6 an external magnetic field for micromagnetization using the input parameters, and initializing a time;
7 a unit obtaining a solution of the magnetic field equation;
8 a unit obtaining a time integral of the ~~LLG~~ Landau Lifshitz Gilbert (LLG) equation using the
9 solution as an external magnetic field for an unstationary LLG equation;
10 a convergence condition determination unit determining whether or not micromagnetization
11 obtained by the time integral satisfies a convergence condition;
12 a magnetic field equation correction unit correcting the magnetic field equation using the
13 obtained micromagnetization when the convergence condition is not satisfied, and stepwise
14 increasing the time; and
15 a control unit repeating the operation of said unit obtaining a solution of the magnetic field
16 equation and subsequent units using the corrected magnetic field equation.

1 Claim 10 (original): The apparatus according to claim 9, further comprising
2 a magnetic field calculation unit obtaining a magnetic field by micromagnetization using
3 micromagnetization obtained by the time integral of the LLG equation when the convergence
4 condition is satisfied.

1 Claim 11 (currently amended): A micromagnetization analyzing apparatus, comprising:
2 input unit means for receiving an input of a parameter of a micromagnetization vector

3 assigned to a center of a divided microelement of an area to be analyzed, and a parameter of vector
4 potential assigned to a side or node of the microelement;

5 magnetic field equation generation means for generating a magnetic field equation for
6 providing an external magnetic field for micromagnetization using the input parameters, and
7 initializing a time;

8 means for obtaining a solution of the magnetic field equation;

9 means for obtaining a time integral of the ~~LLG~~ Landau Lifshitz Gilbert (LLG) equation using
10 the solution as an external magnetic field for an unstationary LLG equation;

11 convergence condition determination means for determining whether or not
12 micromagnetization obtained by the time integral satisfies a convergence condition;

13 magnetic field equation correction means for correcting the magnetic field equation using the
14 obtained micromagnetization when the convergence condition is not satisfied, and stepwise
15 increasing the time; and

16 control means for repeating the operation of said means obtaining a solution of the magnetic
17 field equation and subsequent means using the corrected magnetic field equation.

1 Claim 12 (original): The apparatus according to claim 9, wherein

2 said magnetic field equation is a stationary magnetic field equation using vector potential.

1 Claim 13 (original): The apparatus according to claim 9, wherein
2 said magnetic field equation is an unstationary magnetic field equation.

1 Claim 14 (original): The apparatus according to claim 9, wherein
2 the unit obtaining the time integral of the LLG equation sets a product of a difference
3 between micromagnetization vector assigned to a target element and micromagnetization vector
4 assigned to an adjacent element and an exchange interaction coefficient is set as an exchanged
5 magnetic field by an exchange interaction with the adjacent element.

 Claim 15 (canceled).

1 Claim 16 (original): The signal according to claim 9, wherein
2 the unit obtaining the time integral of the LLG equation sets a product of an externally
3 specified one of an exchange interaction coefficient assigned to a boundary of an element group
4 formed by a plurality of elements and an exchange interaction coefficient assigned to the element
5 group, and a difference between micromagnetization vector assigned to a target element and
6 micromagnetization vector assigned to an adjacent element as an exchanged magnetic field for an
7 element contacting the boundary.

1 Claim 17 (original): The apparatus according to claim 9, wherein
2 the unit obtaining the time integral of the LLG equation, for an element contacting a
3 boundary of an element group formed by a plurality of elements, sets a value of an exchanged
4 magnetic field by using either an externally received input value of an exchanged magnetic field
5 assigned to the boundary, or an input value of an exchange interaction coefficient which depend on
6 a size of an element and which is multiplied by the different between micromagnetization vector
7 assigned to a target element and micromagnetization vector assigned to an adjacent element to obtain
8 the exchanged magnetic field.

1 Claim 18: (new): A storage medium having stored thereon a set of instructions for
2 implementing a method, said set of instructions comprising at least one instruction for:
3 receiving an input of a parameter of a micromagnetization vector assigned to a center of a
4 divided microelement of an area to be analyzed, and a parameter of vector potential assigned to a
5 side or node of the microelement;
6 generating a magnetic field equation for providing an external magnetic field for
7 micromagnetization using the input parameters, and initializing a time;
8 obtaining a solution of the magnetic field equation;
9 obtaining a time integral of Landau Lifshitz Gilbert (LLG) equation using the solution as an
10 external magnetic field for an unstationary Landau Lifshitz Gilbert (LLG) equation;
11 determining whether or not micromagnetization obtained by the time integral satisfies a

12 convergence condition;

13 correcting the magnetic field equation using the obtained micromagnetization when the
14 convergence condition is not satisfied, and stepwise increasing the time; and

15 repeating the process of obtaining a solution of the magnetic field equation and subsequent
16 processes.

1 Claim 19 (new): The storage medium of claim 18, said set of instructions further
2 comprising at least one instruction for:

3 obtaining a magnetic field using the micromagnetization obtained by the time integral of the
4 Landau Lifshitz Gilbert (LLG) equation when the convergence condition is satisfied.

1 Claim 20 (new): The storage medium of claim 18, wherein
2 said magnetic field equation is a stationary magnetic field equation using vector potential.

1 Claim 21 (new): The storage medium of claim 18, wherein
2 said magnetic field equation is an unstationary magnetic field equation.

1 Claim 22 (new): The storage medium of claim 18, wherein
2 in the process of obtaining the time integral of the Landau Lifshitz Gilbert (LLG) equation,
3 a product of a difference between micromagnetization vector assigned to a target element and

4 micromagnetization vector assigned to an adjacent element and an exchange interaction coefficient
5 is set as an exchanged magnetic field by an exchange interaction with the adjacent element.

1 Claim 23 (new): The storage medium of claim 18, wherein
2 in the process of obtaining a time integral of the Landau Lifshitz Gilbert (LLG) equation, as
3 an exchanged magnetic field for an element contacting a boundary of an element group formed by
4 a plurality of elements, there is set a product of an externally specified one of an exchange interaction
5 coefficient assigned to the boundary and an exchange interaction coefficient assigned to the element
6 group, and a difference between micromagnetization vector assigned to a target element and
7 micromagnetization vector assigned to an adjacent element.

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